



09/29/00

COMMISSIONER FOR PATENTS, Washington, D.C. 20231

Case Docket No. PHN 17,661

Enclosed for filing is the patent application of Inventor(s):
ROBERT A. BARNES AND DIRK PIEPERS

For: PICTURE SIGNAL PROCESSING

ENCLOSED ARE:

- ☒ Associate Power of Attorney;
☒ Information Disclosure Statement, Form PTO-1449 and copies of documents listed therein;
☒ Preliminary Amendment;
☒ Specification (6 Pages of Specification, Claims, & Abstract);
☒ Declaration and Power of Attorney:
 (2 Pages of a ☒ fully executed ☐ unsigned Declaration);
☒ Drawing (1 sheet of ☐ informal ☒ formal sheets);
☒ Certified copy of EUROPEAN application Serial No. 99307734.6;
☒ Authorization Pursuant to 37 CFR 1.136(a)(3)
☒ Other: RELATED CASES;
☒ Assignment to U.S. PHILIPS CORPORATION.

FEE COMPUTATION

CLAIMS AS FILED				
FOR	NUMBER FILED	NUMBER EXTRA	RATE	BASIC FEE - \$690.00
Total Claims	13- 20 =	0	X \$18 =	0.00
Independent Claims	4 - 3 =	1	X \$78 =	78.00
Multiple Dependent Claims, if any			\$260 =	0.00
TOTAL FILING FEE			=	\$768.00

Please charge Deposit Account No. 14-1270 in the amount of the total filing fee indicated above, plus any deficiencies. The Commissioner is also hereby authorized to charge any other fees which may be required, except the issue fee, or credit any overpayment to Account No. 14-1270.

☐ Amend the specification by inserting before the first line the sentence: This is a continuation-in-part of application Serial No. , filed .

Edward W. Goodman, Reg. No. 28,613
 Attorney
 (914) 333-9611

CERTIFICATE OF MAILING

☒ Express Mail Mailing Label No. EL 458 218 413 U.S.

Date of Deposit

9/29/00

I hereby certify that this paper and fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner for Patents, Washington, D.C. 20231

Name

Signature

Send correspondence and papers to Corporate Patent Counsel
 U.S. Philips Corporation, 580 White Plains Road, Tarrytown, New York 10591

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JC921 U.S. PTO
 09/29/00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

ROBERT A. BARNES ET AL.

PHN 17,661

SERIAL NO.:

GROUP ART UNIT:

FILED: CONCURRENTLY

EXAMINER:

PICTURE SIGNAL PROCESSING

Commissioner for Patents
Washington, D.C. 20231

Sir:

PRELIMINARY AMENDMENT

Prior to calculating the filing fee and examination,
please amend the above-identified application as follows:

IN THE SPECIFICATION

Page 1, before line 1, insert as a centered heading

--BACKGROUND OF THE INVENTION--;

after the heading, insert at the left margin

--Field Of The Invention--;

between lines 3 and 5, insert at the left margin

--Description Of The Related Art--;

line 7, after "e.g." insert --,-- (comma);
after "See" insert --International Patent
Application--;
after "V" insert --, corresponding to U.S. Patent
Application Serial No. 08/863,700, filled May 27,
1997--;

between lines 8 and 10, insert as a centered heading
--SUMMARY OF THE INVENTION--;

lines 13 and 14, delete in their entirety, and insert
--picture signal receiver.--;

between lines 23 and 25, insert as a centered heading
--BRIEF DESCRIPTION OF THE DRAWING--;

line 25, delete in its entirety, and insert --The drawing
includes a sole Figure showing a block diagram of
a (DVD)--;

Page 2, before line 1, insert as a centered heading
--DESCRIPTION OF THE PREFERRED EMBODIMENTS--;

line 9, change "QI1corresponding" to --QI1
corresponding--;

line 25, after "e.g." insert --,-- (comma);

Page 3, line 4, after "and" insert --,-- (comma);

line 5, after "hence" insert --,-- (comma);

line 7, after "optimization" insert --,-- (comma);

line 14, change "mosquito" to --mosquito--;

lines 26 and 27, delete in their entirety, and insert
--corresponding quality indication. The word
"comprising" does not--.

IN THE ABSTRACT

Page 6, before line 1, delete in its entirety, and insert as a
centered heading
--ABSTRACT OF THE DISCLOSURE--;
after line 7, delete in its entirety.

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A picture signal processing method[,] comprising the steps [of]:

receiving an analog picture signal [(APS1, APS2)] and a quality indication [(QI1, QI2)] relating to the analog picture

5 signal [(APS1, APS2)]; and

processing [(PSP)] the analog picture signal [(APS1, APS2)] in dependence on the quality indication [(QI1, QI2)].

2. (Amended) [A] The method as claimed in claim 1, wherein the processing step [(PSP)] includes a picture enhancement operation.

3. (Amended) [A] The method as claimed in claim 2, wherein the picture enhancement operation [(PSP)] is a sharpness and/or contrast improving operation.

4. (Amended) [A] The method as claimed in claim 2, wherein the picture enhancement operation [(PSP)] is a noise or encoding artifact reduction operation.

5. (Amended) [A] The method as claimed in claim 1, wherein the analog picture signal [(APS1, APS2) has been obtained] is formed by decoding a digital picture signal [that has been obtained by encoding] having been encoded at a bit-rate and/or at a compression

9. (Amended) [A] The method as claimed in claim 8, wherein the analog picture signal [(APS1, APS2) has been obtained] is formed by decoding a digital picture signal [that has been obtained by encoding] having been encoded at a bit-rate and/or at a compression ratio and/or at a quantization level, and wherein the quality indication [(QI1, QI2)] is the bit-rate and/or the compression ratio and/or the quantization level and/or other information about the encoding or decoding.

10. (Amended) A picture signal supplying device, comprising:
means for supplying an analog picture signal [(APS1, APS2)]; and
means for supplying a quality indication [(QI1, QI2)] relating to the analog picture signal [(APS1, APS2)].

11. (Amended) [A] The picture signal supplying device as claimed in claim 10, wherein the picture signal supplying device further [comprising] comprises:

means for decoding [(DEC1, DEC2)] a digital picture signal [that has been obtained by encoding] having been encoded at a bit-rate and/or at a compression ratio and/or at a quantization level, to furnish the analog picture signal [(APS1, APS2)], the quality indication [(QI1, QI2)] being the bit-rate and/or the compression


REMARKS

The specification has been amended in various places to correct typographical and grammatical errors. The specification has also been amended to add section headings.

The claims have been amended to more clearly define the invention as disclosed in the written description. In particular, the claims have been amended for clarity.

When the Examiner takes this case up for examination, it is respectfully requested that this Preliminary Amendment be taken into consideration.

Respectfully submitted,

by 
Edward W. Goodman, Reg. 28,613
Attorney
Tel.: 914-333-9611

Picture signal processing.

The invention relates to a picture signal processing method and device, a picture signal supplying method and device, a television receiver, a record player and a picture signal receiver.

5 It is known to use motion vectors transmitted as part of an MPEG signal both in an MPEG decoder and in post-processing circuitry to enhance an MPEG decoder output signal, e.g. by doubling the field-rate. See WO-A-97/46022, section V (attorneys' docket PHN 16.112).

10 It is, inter alia, an object of the invention to provide an improved picture signal processing. To this end, the invention provides a picture signal processing method and device, a picture signal supplying method and device, a television receiver, a record player and a picture signal receiver as defined in the independent claims. Advantageous embodiments are defined in the dependent claims.

15 In a picture signal processing method in accordance with an aspect of the invention, an analog picture signal is processed in dependence on a quality indication relating to the analog picture signal and received together with the analog picture signal. Preferably, the analog picture signal has been obtained by decoding a digital picture signal that has been obtained by encoding at a bit-rate and/or at a compression ratio and/or at a quantization level,
20 wherein the quality indication is the bit-rate and/or the compression ratio and/or the quantization level and/or other information about the encoding or decoding.

These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

25 The drawing shows a configuration comprising embodiments of a (DVD) record player, a picture signal receiver (set-top box) and a television receiver in accordance with the present invention.

A record player RP comprises a decoder DEC1 (such as an MPEG decoder, alternatives are possible) for decoding a digital picture signal retrieved from a storage medium such as a digital versatile disk (DVD). Other digital record media, such as tape, are alternatively possible. The record player RP may have an antenna input for receiving a digital picture signal. In that manner, the decoder DEC1 can be used both for stored signals and for signals received from air (or thru cable).

In accordance with the present invention, the decoder DEC1 does not just supply a decoded first analog picture signal APS1, but also a first quality indication QI1 corresponding to the first analog picture signal APS1. Preferably, the first quality indication QI1 is the bit-rate and/or the compression ratio and/or the quantization level at which the digital picture signal has been encoded and/or other information about the encoding or decoding, such as information about the level of compression via inverse quantization process and/or quantizer matrix (for intra and non-intra pictures) when the default ones are not used and/or intra-dc-precision and/or information when a decoding error happened.

The drawing further shows a picture signal receiver in the form of a set-top box STB comprising a reader for a smart card SC and a decoder DEC2 corresponding to the decoder DEC1 for decoding a digital picture signal received from an antenna A2 or thru cable. The decoder DEC2 supplies a second analog picture signal APS2 and a corresponding second quality indication QI2.

A television receiver TV includes inputs for the analog picture signals APS1, APS2 and the corresponding quality indications QI1, QI2. The connections between the record player RP and the TV set may be thru a well-known SCART cable for a parallel transmission of the analog picture signal APS1/2 and the corresponding quality indication QI1/2, or thru a serial connection such as USB. As a further alternative, the quality indication QI1/2 may be transmitted within the corresponding analog picture signal APS1/2, e.g. in a teletext line of the analog picture signal APS1/2. A switch S1 selects the first analog picture signal APS1 or the second analog picture signal APS2 to obtain a selected analog picture signal. A switch S2 selects the first quality indication QI1 or the second quality indication QI2 to obtain a selected quality indication. The switches S1, S2 may belong to a single electronic switch unit. The selected analog picture signal is subjected to a picture signal processing PSP, such as a picture signal enhancement like a peaking operation, noise reduction operation, MPEG artifact reduction operation, coring operation or histogram operation. The picture signal processing PSP is controlled by a picture signal control in dependence on the selected analog picture

signal and the selected quality indication. The resulting processed picture signal is displayed on a display device DD.

The invention is based on the recognition that sending a quality indication with an analog picture signal allows a TV to determine the characteristics of the source material and hence make an informed selection of algorithm. A better picture quality will result from the application of a more appropriate processing to the signal. Giving a picture signal processing unit the information it needs to enable it to do the appropriate optimization prevents it from "optimizing" a picture that is already OK, or from "optimizing" it in the wrong way. For example, if the quality of the analog picture signal is low, because the digital picture signal from which the analog picture signal has been retrieved had been encoded at a low quantization level, a low bit-rate and/or a high compression ratio, a picture signal enhancement operation such as a peaking or histogram operation to improve sharpness and/or contrast would only render the blocking artifacts more visible. So, if the quality indication indicates a low quality, a peaking operation is preferably switched off. On the other hand, mosquito noise present in a low-quality signal could be reduced by appropriately adjusting a noise reduction operation forming part of the picture signal processing PSP in dependence upon the quality indication. The TV can accommodate different sources, with different (and possibly dynamically changing) signal qualities. While in the embodiment, the TV receiver has two inputs (APS1, QI1) and (APS2, QI2), it is not necessary to have two sources in the system for the invention to have a benefit.

It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. The record player RP may have recording facilities, and the notion record player includes any apparatus that is able to play and decode a recorded digital picture signal to obtain an analog picture signal plus a corresponding quality indication. In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. The word "comprising" does not exclude the presence of elements or steps other than those listed in a claim. The word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. The invention can be implemented by means of hardware comprising several distinct elements, and by means of a suitably programmed computer. In the device claim enumerating several means, several of these means can be embodied by one and the same item of hardware. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

CLAIMS:

1. A picture signal processing method, comprising the steps of:
receiving an analog picture signal (APS1, APS2) and a quality indication (QI1, QI2) relating to the analog picture signal (APS1, APS2); and
processing (PSP) the analog picture signal (APS1, APS2) in dependence on the
5 quality indication (QI1, QI2).

2. A method as claimed in claim 1, wherein the processing step (PSP) includes a picture enhancement operation.

10 3. A method as claimed in claim 2, wherein the picture enhancement operation (PSP) is a sharpness and/or contrast improving operation.

4. A method as claimed in claim 2, wherein the picture enhancement operation (PSP) is a noise or encoding artifact reduction operation.

15 5. A method as claimed in claim 1, wherein the analog picture signal (APS1, APS2) has been obtained by decoding a digital picture signal that has been obtained by encoding at a bit-rate and/or at a compression ratio and/or at a quantization level, and wherein the quality indication (QI1, QI2) is the bit-rate and/or the compression ratio and/or the
20 quantization level and/or other information about the encoding or decoding.

6. A picture signal processing device, comprising:
means for receiving an analog picture signal (APS1, APS2) and a quality indication (QI1, QI2) relating to the analog picture signal; and
25 means (PSP) for processing the analog picture signal (APS1, APS2) in dependence on the quality indication (QI1, QI2).

7. A television receiver (TV) comprising:

a picture signal processing device (PSP) as claimed in claim 6 for furnishing a processed picture signal; and
means (DD) for displaying the processed picture signal.

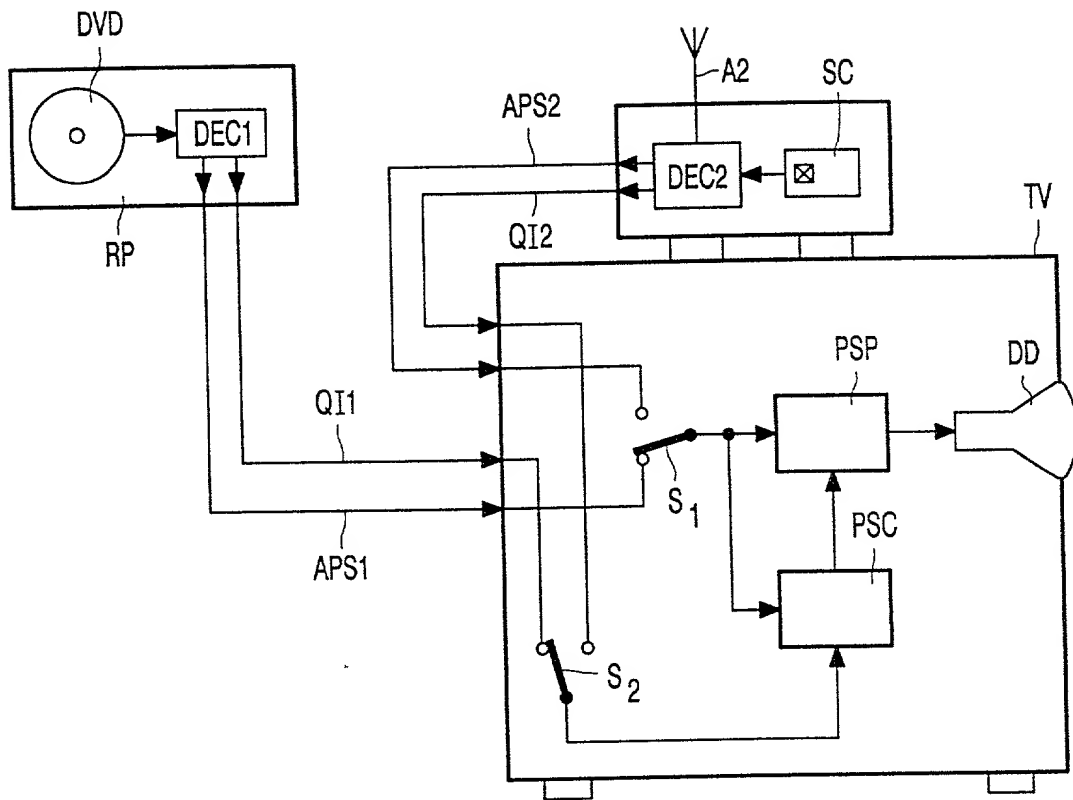
- 5 8. A picture signal supplying method, comprising the steps of:
supplying an analog picture signal (APS1, APS2); and
supplying a quality indication (QI1, QI2) relating to the analog picture signal (APS1, APS2).
- 10 9. A method as claimed in claim 8, wherein the analog picture signal (APS1, APS2) has been obtained by decoding a digital picture signal that has been obtained by encoding at a bit-rate and/or at a compression ratio and/or at a quantization level, and wherein the quality indication (QI1, QI2) is the bit-rate and/or the compression ratio and/or the quantization level and/or other information about the encoding or decoding.
- 15 10. A picture signal supplying device, comprising:
means for supplying an analog picture signal (APS1, APS2); and
means for supplying a quality indication (QI1, QI2) relating to the analog picture signal (APS1, APS2).
- 20 11. A picture signal supplying device as claimed in claim 10, further comprising:
means for decoding (DEC1, DEC2) a digital picture signal that has been obtained by encoding at a bit-rate and/or at a compression ratio and/or at a quantization level, to furnish the analog picture signal (APS1, APS2), the quality indication (QI1, QI2) being the bit-rate and/or the compression ratio and/or the quantization level and/or other information about the encoding or decoding.
- 25 12. A record player (RP), comprising:
means for retrieving a digital picture signal from a record (DVD); and
a picture signal supplying device (DEC1) as claimed in claim 11.
- 30 13. A picture signal receiver (STB), comprising:
means (A2) for receiving a digital picture signal; and
a picture signal supplying device (DEC2) as claimed in claim 11.

ABSTRACT:

In a picture signal processing method, an analog picture signal (APS1, APS2) is processed (PSP) in dependence on a quality indication (QI1, QI2) relating to the analog picture signal (APS1, APS2) and received together with the analog picture signal (APS1, APS2).

Preferably, the analog picture signal (APS1, APS2) has been obtained from a digital picture signal that has been encoded at a bit-rate and/or at a compression ratio and/or at a quantization level, wherein the quality indication (QI1, QI2) is the bit-rate and/or the compression ratio and/or the quantization level.

(Fig.)



DECLARATION and POWER OF ATTORNEY

ATTORNEY'S DOCKET NO.:

PHN 17.661 US

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled
"Picture signal processing"

the specification of which (check one)

☒ is attached hereto.

☐ was filed on _____ as Application Serial No. _____ and was amended on _____ (if

applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by the amendment(s) referred to above.

I acknowledge the duty to disclose information which is material to patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

COUNTRY	APP. NUMBER	DATE OF FILING (DATE, MONTH, YEAR)	PRIORITY CLAIMED UNDER 35 U.S.C. 119
Europe	99307734.6	30 September 1999	YES

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35 United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

PRIOR UNITED STATES APPLICATION(S)

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (PATENTED, PENDING, ABANDONED)

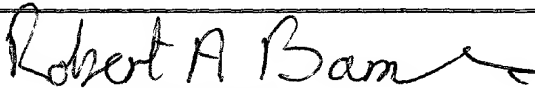
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Algys Tamoshunas, Reg. No. 27,677

Jack E. Haken, Reg. No. 26,902

SEND CORRESPONDENCE TO: Corporate Patent Counsel; U.S. Philips Corporation; 580 white Plains Road; Tarrytown, NY 10591	DIRECT TELEPHONE CALLS TO: (name and telephone No.) (914) 332-0222
--	--

Dated: 24 August 2000		Inventor's Signature: 	
Full Name of in Inventor	Last Name BARNES	First Name Robert	Middle Name A.
Residence & Citizenship	City Caterham	State of Foreign Country Great Britain	Country of Citizenship Great Britain
Post Office Address	Street 35 Townend	City Caterham, Surrey CR3 5UJ	State of Country Great Britain
Dated:		Inventor's Signature:	
Full Name of in Inventor	Last Name PIEPERS	First Name Dirk	Middle Name
Residence & Citizenship	City Brugge	State of Foreign Country Belgium	Country of Citizenship Belgium
Post Office Address	Street Herfstlaan 8	City B-8200 Brugge	State of Country Belgium
		Zip Code	

DECLARATION and POWER OF ATTORNEY

ATTORNEY'S DOCKET NO.:
PHN 17.661 US

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled
"Picture signal processing"

the specification of which (check one)

☒ is attached hereto.

☐ was filed on _____ as Application Serial No. _____ and was amended on _____ (if

applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by the amendment(s) referred to above.

I acknowledge the duty to disclose information which is material to patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

COUNTRY	APP. NUMBER	DATE OF FILING (DATE, MONTH, YEAR)	PRIORITY CLAIMED UNDER 35 U.S.C. 119
Europe	99307734.6	30 September 1999	YES

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35 United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

PRIOR UNITED STATES APPLICATION(S)


APPLICATION SERIAL NUMBER	FILING DATE	STATUS (PATENTED, PENDING, ABANDONED)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Algy Tamoshunas, Reg. No. 27,677
Jack E. Haken, Reg. No. 26,902

SEND CORRESPONDENCE TO: Corporate Patent Counsel; U.S. Philips Corporation; 580 white Plains Road; Tarrytown, NY 10591	DIRECT TELEPHONE CALLS TO: (name and telephone No.) (914) 332-0222
--	--

Dated:		Inventor's Signature:	
Full Name of in Inventor	Last Name BARNES	First Name Robert	Middle Name A.
Residence & Citizenship	City Caterham	State of Foreign Country Great Britain	Country of Citizenship Great Britain
Post Office Address	Street 35 Townend	City Caterham, Surrey CR3 5UJ	State of Country Great Britain
Zip Code			
Dated: 7 September 2000		Inventor's Signature: 	
Full Name of in Inventor	Last Name PIEPERS	First Name Dirk	Middle Name
Residence & Citizenship	City Brugge	State of Foreign Country Belgium	Country of Citizenship Belgium
Post Office Address	Street Herfstlaan 8	City B-8200 Brugge	State of Country Belgium
Zip Code			

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

ROBERT A. BARNES ET AL.

PHN 17,661

Filed: CONCURRENTLY

PICTURE SIGNAL PROCESSING

Commissioner for Patents, Washington, D.C. 20231

APPOINTMENT OF ASSOCIATES

Sir:

The undersigned Attorney of Record hereby revokes all prior appointments (if any) of Associate Attorney(s) or Agent(s) in the above-captioned case and appoints:

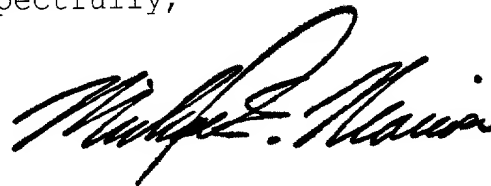
EDWARD W. GOODMAN

(Registration No. 28,613)

c/o U.S. PHILIPS CORPORATION, Intellectual Property Department, 580 White Plains Road, Tarrytown, New York 10591, his Associate Attorney(s)/Agent(s) with all the usual powers to prosecute the above-identified application and any division or continuation thereof, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

ALL CORRESPONDENCE CONCERNING THIS APPLICATION AND THE LETTERS PATENT WHEN GRANTED SHOULD BE ADDRESSED TO THE UNDERSIGNED ATTORNEY OF RECORD.

Respectfully,



Michael E. Marion, Reg. 32,266
Attorney of Record

Dated at Tarrytown, New York
on September 28, 2000.